



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,860	08/07/2002	Andrew Philip Jeapes	5648	2359
6858	7590	09/21/2004	EXAMINER	
BREINER & BREINER 115 NORTH HENRY STREET P. O. BOX 19290 ALEXANDRIA, VA 22314			HERTZOG, ARDITH E	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/049,860	JEAPES ET AL. <i>JA</i>
Examiner	Art Unit	
Ardith E. Hertzog	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 2/19, 8/7, & 11/6, 2002.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3 is/are rejected.
- 7) Claim(s) 4-21 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/19/02</u> .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Priority/Status of Claims

1. This application has been filed under 35 U.S.C. § 371 based upon International Application PCT/GB00/03234, filed August 21, 2000, and published (in English) as WO 01/15175 on March 1, 2001. In accordance with MPEP § 1893.03(e), acknowledgement is made of the corresponding International Search Report (Form PCT/IPEA/210) and International Preliminary Examination Report (Form PCT/IPEA/409). Acknowledgment is also made of applicant's claim for priority under 35 U.S.C. § 119(a)-(d); the certified copy has been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). **Claims 1-21**, per the amendment filed November 9, 2001 in PCT/GB00/03234 and referred to in applicant's declaration (i.e., a PCT Article 34 amendment, entered in this national stage application unless specifically requested otherwise by applicant (see MPEP § 1893.01(a)(3)), are now pending.

Information Disclosure Statement

2. Receipt is hereby acknowledged of the information disclosure statement, filed February 19, 2002. As the submission is in compliance with the provisions of 37 CFR § 1.97, the information disclosure statement has been considered, in accordance with the enclosed PTO-1449.

Oath/Declaration/Inventorship

3. The declaration is considered defective, because:

- a. It does not correctly identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR § 1.55, and any

foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing;

and

b. The full name of each inventor (family name and at least one given name together with any initial) has not been set forth (see MPEP § 605.04(b)).

4. With respect to 3a., the claim to **foreign** priority benefits to the “parent” PCT (international) application (i.e., PCT/GB00/03234) is incorrect, since the instant application is considered **the same as** this “parent” PCT application, **the only difference being that it has now entered the national stage under 35 U.S.C. § 371**, as noted *supra* (that is, the “parent” PCT application is **not** a “prior filed international application”, per 35 U.S.C. § 365(a) (emphasis added)). Note that the “parent” PCT application is **already** identified by applicant’s statement in the declaration that the instant specification corresponds to “PCT International Application Number PCT/GB00/03234”. Further note that as this same incorrect **foreign** priority claim is present in the application data sheet (ADS) filed February 19, 2002, the ADS cannot be relied upon to rectify this deficiency.

5. With respect to 3b., for each of the following four inventors, “R. C. Thied”, “W. R. Pitner”, “D. W. Rooney”, and “T. Welton”, the executed declaration filed August 7, 2002, fails to recite “at least one given name” (although “William Robert Pitner” has been handwritten next to the typewritten “W. R. Pinter” on page 5 of the executed declaration, since handwritten and not dated and initialed immediately adjacent (per 37 CFR § 1.52(c)(1)), only the abbreviated name “W. R. Pinter” is officially of record). Note that as only these abbreviated names are those present in the ADS filed February 19, 2002,

it cannot be relied upon to rectify these deficiencies.

6. **Accordingly**, a new declaration (or oath) in compliance with 37 CFR § 1.67(a), or ADS (see 37 CFR § 1.76 and MPEP § 601.05), identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

7. **In addition**, note that in the ADS filed February 19, 2002, the first named inventor is identified as "A. J. Jeapes"—in accordance with the first named inventor listed on WO 01/15175 (i.e., the WIPO publication corresponding to the "parent" PCT application)—whereas in the executed declaration, the first named inventor is identified as "Andrew Philip Jeapes". **Therefore, it appears that a petition under 37 CFR § 1.182 is now required in order to accept a declaration (or oath) with the new/changed name "Andrew Philip Jeapes"**, in accordance with the last paragraph of MPEP § 1893.01(e):

Where there has been no change of inventorship but the name of an inventor indicated in the international application is different from the corresponding name indicated in an oath or declaration submitted under 37 CFR § 1.497, for example, on account of marriage, then a petition under 37 CFR § 1.182 will be required to accept the oath or declaration with the changed name. See MPEP § 605.04(c).

Claim Objections

8. Claims 4-21 are objected to under 37 CFR § 1.75(c) as being in improper form, because a multiple dependent claim (MDC) may not serve as basis for any other MDC. See MPEP § 608.01(n) (see also PCT Rule 6.4(a)). Note that MDC's 4-6, 11, 13, 15-17 and 19 at least indirectly depend upon at least one other MDC. Further note that claims 7-10, 12, 14, 18, 20 and 21 are correspondingly improper, since they at least indirectly depend upon at least one of the improper MDC's. **Accordingly, as the intended**

scope of claims 4-21 cannot be accurately determined, they have not been further treated on the merits.

Minor Informalities

9. The disclosure is objected to, because of the following minor informalities:
 - a. At page 1, line 11, ("24446331, 2446339, 2446350)" should be revised as "2,446,331; 2,446,349; 2,446,350" (that is, the first two patent numbers currently listed are incorrect).
 - b. "While there is no set statutory form for claims, the present Office practice is to insist that each claim must be the object of a sentence starting with 'I (or we) claim,' 'The invention claimed is' (or the equivalent)" (see MPEP § 608.01(m)).
 - c. In claim 1, at line 2 thereof, it is suggested that "composition" be inserted after "said ionic liquid", for consistency with the claim 1 preamble.
 - d. In line 1 of **both dependent** claims 2 and 3, it is suggested that "A" be revised as "The", for clarity (since, again, claims 2 and 3 are **dependent** claims).

Appropriate correction of all the above is required.

Claim Rejections - 35 U.S.C. § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
11. Claims 1-3 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for methods for treating a spent ionic liquid composition, which comprises the **specific** ionic liquid, 1-methyl-3-ethylimidazolium

chloride, and contaminants, comprising: heating said ionic liquid composition **under reduced pressure at or below 2 mm Hg to a temperature ranging from 200 °C to 300 °C** so as to form a partial decomposition product thereof; separating said product from said contaminants; and reacting the separated product with a reactant to regenerate said ionic liquid; does not reasonably provide enablement for methods for treating a spent ionic liquid composition, which comprises **any** ionic liquid and contaminants, comprising: **generally** heating the ionic liquid composition so as to form a partial decomposition product thereof; separating said product from said contaminants; and reacting the separated product with a reactant to regenerate said ionic liquid; per the current independent claim 1 (upon which claims 2 and 3 depend). It is respectfully submitted that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims, since only a **single** species of suitable "spent ionic liquid" and corresponding "partial decomposition product[s] thereof" appear to be disclosed (i.e., 1-methyl-3-ethylimidazolium chloride, and its partial decomposition products of 1-methylimidazole, 1-ethylimidazole, chloromethane, and chloroethane (see paragraph bridging pp. 2-3 of the specification, as well as p. 4, lines 3-5, therein)), for which the **single** set of suitable heating temperature and pressure limitations disclosed (i.e., temperature from 200°C to 300°C, and pressure at or below 2 mm Hg (see p. 3, lines 15-16, 24-27, of the specification)) is effective. **Furthermore**, applicant states that:

When 1-methyl-3-ethylimidazolium chloride is heated under reduced pressure, the ionic liquid partially decomposes to give 1-methylimidazole,

1-ethylimidazole, chloromethane, and chloroethane. In the initial experiments the thermolysis products were left for two days at room temperature and re-acted to produce a mixture of 1,3-dimethylimidazolium chloride, 1,3-diethylimidazolium chloride, and 1-methyl-3-ethylimidazolium chloride. **These results are surprising because thermal decomposition was previously considered to destroy any potential for recycling of the ionic liquid.** In the light of these experiments however thermal decomposition for the cleaning of ionic liquids is now an economically viable alternative. (paragraph bridging pp. 2-3 of the specification, emphasis added)

With the above statements then, applicant apparently acknowledges that the heating of ionic liquids is an **at least somewhat unpredictable art**. **Accordingly**, it is respectfully submitted that one of ordinary skill in the art would have to resort to undue experimentation in order to determine what **other ionic liquids and corresponding other** heating temperature and pressure limitations would be effective in the methods of applicant's claims 1-3, especially as the specification provides **no** working examples (not even for the evidently preferred "spent ionic liquid", 1-methyl-3-ethylimidazolium chloride). It is respectfully noted that a **substantially similar** issue with respect to the specific heating temperature and pressure limitations was **also** discussed in the International Preliminary Examination Report for PCT/GB00/03234 (see paragraph bridging Separate Sheets 1-2 of Form PCT/IPEA/409). Appropriate correction is required.

12. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 1-3 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claims are considered vague, indefinite, and/or

confusing, because: 1) **When read in light of the specification**, it appears that applicant's "reacting" step actually occurs **prior to** applicant's "separating" step in the disclosed methods (see the DETAILED DESCRIPTION OF THE INVENTION at pp. 3-4, especially p. 4, lines 25-27), yet in the independent claim 1 (upon which claims 2 and 3 depend), the "reacting" step is recited **after** the "separating" step. 2) **When read in light of the specification**, "the partial decomposition product" and "reactant", as recited in independent claim 1, **appear to read upon one another** (see the DETAILED DESCRIPTION OF THE INVENTION at pp. 3-4, especially p. 4, lines 18-23; see also paragraph bridging pp. 2-3). That is, besides the "partial decomposition product[s]", it cannot be determined what **other** "reactant[s]" fall within the scope of the instant claims. **Moreover**, if the only "reactant[s]" are indeed the "partial decomposition product[s]", then the instant claims currently encompass methods wherein the "partial decomposition product" reacts with **itself**. **Thus**, in light of 1) and 2), it is respectfully submitted that the intended scope of instant claims 1-3 cannot be accurately determined. Appropriate correction of both aspects of this rejection is required.

14. Claim 3 is **further** rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This multiple dependent claim is considered **further** vague, indefinite, and/or confusing, because it may depend on **itself**. Appropriate correction is required.

Allowable Subject Matter

15. Initially, it is noted that instant claims 1-3 have been searched as thoroughly as

possible, given the various 35 U.S.C. § 112 problems discussed *supra*, and, at this point in prosecution, no prior art of record appears to teach or to have suggested methods "for treating a spent ionic liquid composition" comprising all steps presumably recited in these claims of applicant. **Therefore:**

16. Claims 1-3 would be allowable over the prior art of record ***if rewritten or amended to overcome all rejections under 35 U.S.C. §112, first and second paragraphs, set forth in this Office action.***

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2,446,331; 2,446,349; 2,446,350 are discussed on page 1 of applicant's specification. Note that US 6,379,634 B1 is the US equivalent of WO 98/061606. Although not available as prior art against the instant claims, US 6,468,495 B1 has been cited since the US equivalent of WO 99/14160 cited on applicant's PTO-1449.

18. Any inquiry concerning this communication should be directed to Ardith E. Hertzog at telephone number (571) 272-1347. The examiner can normally be reached on Monday through Friday (from about 7:30 a.m. - 3:30 p.m.).

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached at (571) 272-1358. The fax phone number for the organization where this application is assigned is 703-872-9306.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



STANLEY S. SILVERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700



AEH
September 17, 2004